

### DoD to Award \$167 Million in Research Funding

DEPARTMENT OF DEFENSE NEWS  
RELEASE (APRIL 14, 2014)

The Department of Defense (DoD) today announced plans to issue 24 awards totaling \$167 million over the next five years to academic institutions to perform multidisciplinary basic research. The Multidisciplinary University Research Initiative (MURI) program supports research conducted by teams of investigators that intersect more than one traditional science and engineering discipline in order to accelerate research progress.

The Army Research Office, the Air Force Office of Scientific Research, and the Office of Naval Research solicited proposals in 24 topics important to DoD and the military services. Initially, 361 white papers were received, 88 of which were selected for more detailed proposals. The awards were selected based on a merit review by a panel of experts and are subject to successful negotiation between the institution and DoD. The awards announced today are for a five-year period subject to availability of appropriations and satisfactory research progress.

The highly competitive MURI program complements other DoD basic research efforts which fund traditional, single-investigator university, industry, and department laboratory grants, by supporting multidisciplinary teams with larger and longer term awards, in carefully chosen research topics identified for their potential for significant and sustained progress. Like single-investigator awards, MURI awards provide strong support for the education and training of graduate students in cutting-edge research. Based on the proposals selected in the fiscal 2014 competition, a total of 64 academic institutions are expected to participate in these 24 research efforts.

For more than 25 years, DoD's MURI program has resulted in significant capabilities for our military forces and opened up entirely new lines of research. Examples include advances in laser frequency combs that have become the gold standard in frequency control for precision in navigation and tar-



President Barack Obama talks with recipients of the Presidential Early Career Award for Scientists and Engineers in the East Room of the White House, April 14, 2014.

White House photo by Pete Souza

getting; atomic and molecular self-assembly projects that have opened new possibilities for nano-manufacturing; and the field of spintronics emerged from a MURI award on magnetic materials and devices research.

The list of projects selected for fiscal 2014 funding may be found at <http://www.defense.gov/pubs/FY14-MURITeamsRecommended.pdf>.

### President Honors Defense Department Scientists

AMERICAN FORCES PRESS SERVICE (APRIL 18, 2014)

Claudette Roulo

WASHINGTON—Twenty scientists and engineers funded by the Defense Department were part of a group honored by President Barack Obama at the White House on April 14.

A total of 102 scientists and engineers received the Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the U.S. government on science and engineering professionals in the early stages of their independent research careers, according to a White House news release.

The group received their awards in a ceremony at the Agriculture Department before heading to the White House, where Obama thanked them for their achievements.

"The impressive achievements of these early-stage scientists and engineers are promising indicators of even greater successes ahead," Obama said when the recipients were announced in December. "We are grateful for their commitment to generating the scientific and technical advancements that will ensure America's global leadership for many years to come."

Award recipients are employed or funded by several departments or agencies in addition to the Defense Department, including the departments of Agriculture, Commerce, Education, Energy, Health and Human Services, Interior and Veterans Affairs, as well as the Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and the intelligence community.

The agencies join together annually to nominate scientists and engineers whose early accomplishments show the greatest promise for assuring the nation's dominance in science and engineering fields.

"Awardees are selected for their pursuit of innovative research at the frontiers of science and technology and their commitment to community service as demonstrated through scientific leadership, public education, or community outreach," the White House release said.

The awards were established by President Bill Clinton in 1996 and are coordinated by the Office of Science and Technology Policy within the Executive Office of the President. The Defense Department recipients are:

- Dr. Jennifer A. Dionne, Stanford University/Air Force Office of Scientific Research, for pioneering contributions to the control of light-matter interactions on deeply sub wavelength scales, innovative work on nanoscale physical, chemical, and biological phenomena, and enthusiastic leadership and service;
- Dr. Mohamed L. El-Naggar, University of Southern California/Air Force Office of Scientific Research, for experimental and theoretical contributions in the field of biophysics, and for mentoring graduate and undergraduate students through highly interdisciplinary research and education activities linking the physical and biological sciences;
- Dr. Gregory D. Fuchs, Cornell University/Air Force Office of Scientific Research, for fundamental contributions in electronics and nanotechnology that will have applications throughout the Defense Department, and for dedication to mentoring graduate and undergraduate students;
- Dr. Kristen L. Grauman, University of Texas at Austin/Office of Naval Research, for fundamental contributions to computer vision and machine learning, leadership in the research community, and dedication to mentoring students in the sciences;
- Dr. Mona Jarrahi, University of Michigan at Ann Arbor/Office of Naval Research, for innovative work in the development of plasmonics for nanoelectronic and nanophotonic devices with terahertz applications, leadership in the area of terahertz technology, and dedication to outreach and mentoring activities;
- Lane W. Martin, University of Illinois at Urbana-Champaign/Army Research Office, for outstanding research accomplishments relating to the synthesis and study of multifunctional materials and for dedication and commitment to mentoring students in the physical sciences;
- Dr. Yael Niv, Princeton University/Army Research Office, for outstanding research achievements in the field of computational neuroscience, volunteer work with education and charity nonprofit groups, and dedication to mentoring students at all levels;
- Dr. Derek A. Paley, University of Maryland/Office of Naval Research, for outstanding research achievements that apply methods from engineering and biology to the study of collective behavior in robotic and natural systems, and for dedication to teaching and mentoring students;
- Dr. Greg A. Pitz, Air Force Research Laboratory, for fundamental contributions to alkali atomic spectroscopy; the development of hybrid lasers and modeling of innovative new designs that will have applications through the Defense Department, and for outreach and mentoring of high school, undergraduate, and graduate students;
- Dr. Ronald Polcawich, U.S. Army Research Laboratory, for outstanding research accomplishments and leadership in piezoelectric microelectromechanical systems, contributions to the protection of U.S. soldiers, and dedication to mentoring students in the sciences;
- Dr. Rodney D. Priestley, Princeton University/Air Force Office of Scientific Research, for fundamental contributions to understanding the molecular origins of confinement effects on the stability and properties of glassy state polymers, and for a commitment to inspiring and mentoring the next generation of scientists and engineers;
- Dr. Jeremy T. Robinson, Naval Research Laboratory, for outstanding research accomplishments in the development of graphene-based materials, dedication to community service, and mentoring work with students;
- Dr. Onome Scott-Emuakpor, Air Force Research Laboratory, for exceptional contributions to the Air Force Research Laboratory in developing a new understanding of fatigue and fracture mechanisms in turbine engine

components and for mentoring support of graduate and undergraduate students.

- Dr. Ramon van Handel, Princeton University/Army Research Office, for outstanding research accomplishments in stochastic filtering and quantum filtering that will have significant impact on Defense Department operations and for dedication to teaching and mentoring students from underrepresented groups;
- Dr. David M. Weld, University of California at Santa Barbara/Army Research Office, for outstanding research achievements in ultracold atomic physics that will have applications throughout the Defense Department and for mentoring activities with underprivileged students; and
- Dr. Yongjie (Jessica) Zhang, Carnegie Mellon University/Office of Naval Research, for pioneering research in high-fidelity geometric modeling, computational biomedicine, material science and engineering and for dedication to mentoring students in emerging interdisciplinary research areas.

Recipients from the defense intelligence community are:

- Dr. Joanna Arthur, National Geospatial-Intelligence Agency, for expertise and thought leadership in applying advances in cognitive neuroscience to improving human performance, providing analysts and decision-makers with quantitative data that can be used to systematically improve actionable intelligence;
- Dr. Lucy Cohan, Naval Research Office at the time of nomination, for award-winning, world-class research into the integrated design and modeling of the next generation of space telescopes employing lightweight, active mirror technologies;
- Justin Jacobs, National Security Agency, for improving geo-location algorithms by reducing errors in base ellipsoids used to model the Earth's curved surface and for applying rigorous statistical analysis to the development of test plans and test results to document the success or failure of research programs; and
- Dr. Charles Tahan, National Security Agency, for innovative contributions to quantum device and condensed matter physics, including silicon quantum computing, many-body photonics and quantum phonodynamics, and for community service including the creation and management of quantum research programs, leadership in the scientific community and public outreach.

### **Department of Defense Announces Winners of the 2014 Secretary of Defense Environmental Awards**

*DEPARTMENT OF DEFENSE NEWS RELEASE (APRIL 21, 2014)*

The Department of Defense (DoD) has announced the winners of the 2014 Secretary of Defense Environmental

Awards. Each year, since 1962, the department has honored individuals, teams, and installations for their outstanding achievements in environmental performance. For more information on the DoD environmental awards program, visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.

Over the past 10 years, DoD has invested approximately \$42 billion to ensure the success of its environmental programs. In fiscal 2012, DoD spent approximately \$4.1 billion for its environmental programs – \$2.0 billion for environmental restoration activities; \$1.9 billion for environmental quality activities; and \$213.6 million for environmental technology. These investments protect and sustain the environment while strengthening operational capacity, reducing operational costs, and enhancing the well-being of military members, civilians, and their families and communities.

In naming the winners of the 2014 Secretary of Defense Environmental Awards, Frank Kendall, the undersecretary of defense for acquisition, technology and logistics, stated, "Their remarkable achievements exemplify the department's continued commitment to sustain mission readiness while cost-effectively addressing environmental issues, thereby increasing efficiencies and supporting the quality of life for service members, their families, and local communities." The nine winners chosen from 33 nominations are:

- Natural Resources Conservation, Small Installation: Marine Corps Base Hawaii – demonstrated the innovative use of limited funding to protect the environment while accomplishing their mission. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Natural Resources Conservation, Individual/Team: Eglin Air Force Base, Fla., Natural Resources Team – offered long-range solutions that ensured regulatory compliance while maximizing the use of land and water ranges to maintain mission readiness. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Environmental Quality, Non-Industrial Installation: Fort Hood, Texas – led the way in environmental quality innovation and proactive community interaction, partnerships, and training. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Environmental Quality, Individual/Team: Environmental Quality Team, Minnesota National Guard – employed cross-functional expertise in resource protection and conservation, with special attention to informational training and stakeholder involvement. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.

- Sustainability, Industrial Installation: Naval Weapons Station Seal Beach, Calif. – exceeded goals in energy reduction, water conservation, recycling, eliminating hazardous waste, and implementing low-impact development projects demonstrating innovative approaches to sustainability in the face of economic challenges. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Environmental Restoration, Installation: Marine Corps Installation East-Marine Corps Base Camp Lejeune, N.C. – demonstrated cost-effective sustainable efforts to protect human health and the environment in cleaning up contamination from past activities. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Environmental Restoration, Individual/Team: Naval Air Station Cecil Field, Fla. BRAC Cleanup Team – achieved environmental excellence through its quick, innovative, and timely responses to environmental restoration efforts. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Cultural Resources Management, Installation: Fort Wainwright, Alaska – successfully ensured that its lands remain available and in good condition not only to support its mission but also to preserve the cultural history that is inherent to Fort Wainwright's heritage. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.
- Environmental Excellence in Weapon Systems Acquisition, Large Program Individual/Team: Air Force Life Cycle Management Center F-35 Environmental, Safety and Occupational Health Support Team, Wright-Patterson Air Force Base, Ohio – increased efficiencies in aircraft development, project prioritization, resource access, and other critical mission areas that contribute to their environmental and overall excellence in weapon system acquisition. For more information, please visit: <http://www.denix.osd.mil/awards/FY13SECDEF.cfm>.

For more information about the department's environmental programs, please visit: <http://www.denix.osd.mil>.

### **NDW Officer Becomes First Navy Expeditionary Supply Corps Officer**

*NAVAL DISTRICT WASHINGTON PUBLIC AFFAIRS (APRIL 22, 2014)  
Mass Communication Specialist 2nd Class Pedro A. Rodriguez*

WASHINGTON (NNS)—Commandant, Naval District Washington (NDW) Rear Adm. Mark Rich pinned Lt. Cmdr. RoDeece Dean, NDW deputy director for strategy and future requirements, with the Navy Expeditionary Supply Corps Officer (NESCO) breast insignia, April 22.

The Navy Expeditionary Supply Corps Officer program is designed to recognize significant contributions made by Supply Corps officers while serving in operational expeditionary billets. Dean is attached to neither expeditionary nor special warfare command, but was grandfathered by the instruction since he was assigned to SEAL Team Five as the combat surface support commander and one of the first supply corps officers to be assigned to a special warfare unit as a lieutenant after Sept. 11, 2001.

"NDW was very supportive; all of the training that I needed to do under the grandfather clause is online—it's through NKO and some other online resources," said Dean. "I needed to get an endorsement from the admiral, which he gave so from that perspective the command was very supportive."

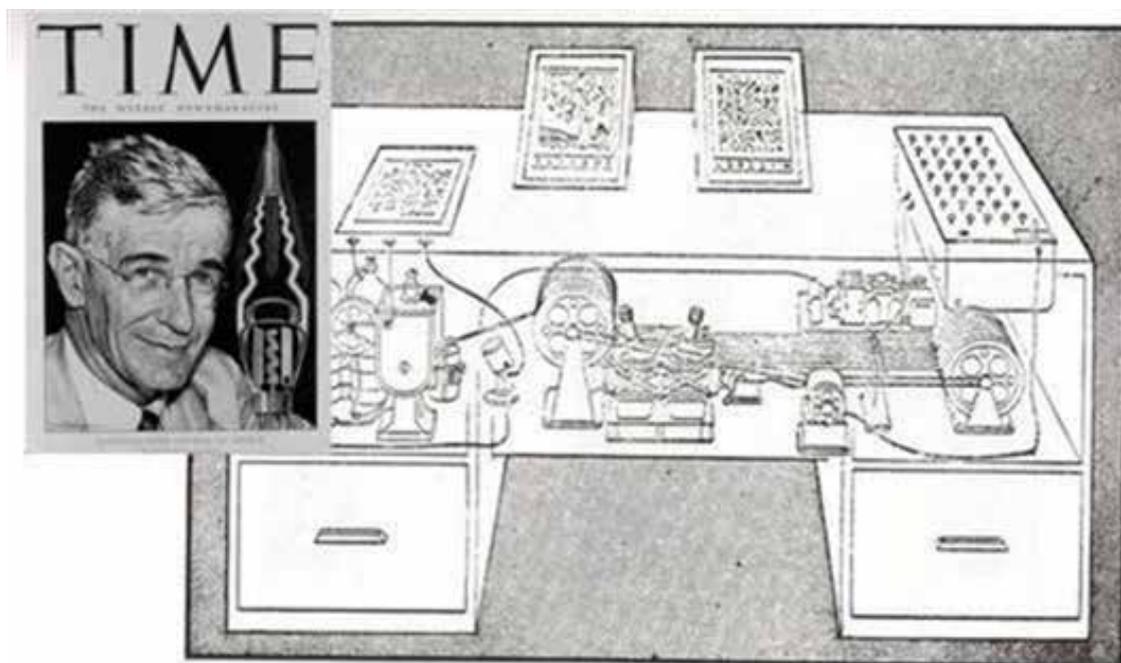
The NESCO is a mandatory qualification for all supply corps officer assigned to units determined by Commander, Navy Expeditionary Combat Command and Commander, Naval Special Warfare Command.

"It was about showing my involvement with the special warfare community; I really enjoyed my time with SEAL Team Five," said Dean. It was one of the most rewarding tours in my career, I had a great bunch of sailors that I worked with and the deployment was a success."

The NESCO is not mandatory for officers with other qualifications as Dean has; he completed his surface warfare supply corps officer qualification in 2004 while assigned to *USS Gary* (FFG 51). He also has the naval parachutist wings, completed in 2009) while assigned to Logistics Support Unit One; the ballistic missile submarine deterrent patrol badge; the Republic of Germany troop duty proficiency badge (gold); the scuba diver badge; and the army parachutist badge.

"One of the pieces of advice that I was given when I was at special warfare was to learn the traditional things as well [and] come back and do other tours," said Dean. "We [in the Supply Corps] don't want officers who only do aviation or who only do submarines, or who only do special warfare. We want supply officers that can do a lot of different jobs and have a lot of different skill sets because the more senior you become, the more leverage you have with those types of experiences."

To learn more about the NESCO, visit <http://doni.daps.dla.mil/Directives/01000%20Military%20Personnel%20Support/01400%20Promotion%20and%20Advancement%20Programs/1412.15.pdf>.



Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).

The Defense Advanced Research Projects Agency is seeking to develop the next generation of search technologies to revolutionize the discovery, organization and presentation of search results. The Memex program ultimately would apply to any public-domain content. Initially, DARPA plans to develop Memex to address a key Defense Department mission: fighting human trafficking. An index curated for the countertrafficking domain, along with configurable interfaces for search and analysis, would enable new opportunities to uncover and defeat trafficking enterprises, officials explained.

DARPA photo

### **DARPA Sows Seeds of Technological Surprise, Director Says**

AMERICAN FORCES PRESS SERVICE (APRIL 30, 2014)

Cheryl Pellerin

WASHINGTON—Many of the advances that contribute to national security resulted from early investment in developing new technologies, the director of the Defense Advanced Research Projects Agency told Congress yesterday.

Dr. Arati Prabhakar represented the Defense Department at a Senate Appropriations Committee hearing called to address concern that the national investment in research and development had shrunk since 2001, along with the education pipeline for young scientists and engineers.

The directors of the Office of Science and Technology Policy of the Executive Office of the President, the National Science Foundation, the National Institutes of Health and the Energy Department also testified at the hearing.

“DARPA is part of Defense Department science and technology investments,” Prabhakar said. “We’re also part of this much larger national ecosystem for R&D. But within those communities, we have one very specific role: to make the pivotal early investments that change what’s possible so we can take big steps forward in our national security capabilities.”

DARPA’s output is technology, but the organization counts its mission complete only when the technologies change outcomes, she added.

“Every time a stealth fighter evades an air defense system, every time a soldier on the ground is able to place himself precisely with GPS and get the data he needs, every time a radar on an aircraft carrier allows us to see a threat to a carrier strike group before it sees us—that’s when we count our mission complete,” Prabhakar said.

In every case, DARPA made a pivotal early investment that showed the technologies were possible, and what followed from that, Prabhakar said, was equally important.

“That was the investment, often by our partners in other parts of the Defense Department and the military services—their science and technology investments, their development investments, or their acquisition programs,” the director said. “Of course,” she added, “many in industry were involved deeply in those efforts, and ultimately to make those technologies into real capabilities for our warfighters.”

Along the way, as DARPA focused on its mission of investments for national security, the organization’s scientists and engineers planted some of the seeds that formed the technology base that the U.S. commercial sector has built layer on layer above the foundation, Prabhakar said.

“Every time you pick up your cell phone and do something as mundane and miraculous as check a social networking site, you’re living on top of a set of technologies that trace back to that early work we did,” she added. “Public investment laid that foundation. Billions of dollars of private investment and enormous entrepreneurship is what built those industries and ended up changing how we live and work with these technologies.”

DARPA’s mission of creating breakthrough technologies for national security is unchanged across more than five decades, she told the panel, but the world in which DARPA invests and pursues its mission continues to change, and so do the things DARPA does that reflect the national security and technology context in which the organization must operate today.

“In one arena, we see information at massive scale affecting every aspect of national security,” the director said. “So if you look in our portfolio today, you will find game-changing investments in cyber and in big-data programs.” One example is work DARPA is doing to tackle the networks that drive human trafficking around the world, she added.

In another arena, Prabhakar said, DARPA is looking at what’s happening with the cost and complexity of military systems today.

“We recognize that [such systems] are becoming too costly and too inflexible to be effective for the next generation of threats we will face around the world,” Prabhakar explained, “so at DARPA we are investing in programs that are fundamentally rethinking complex military systems.”

DARPA is investing in technology its experts believe will lead to powerful new approaches for radar, communications, weapons, and navigation, she said.

“And in a range of research areas, we can see the new seeds of technological surprise,” Prabhakar said. “One example is where biology is intersecting with engineering today, and in areas like that we are making investments that will lead to new technologies like synthetic biology and neurotechnology.”

Another expert who testified before the committee, National Institutes of Health Director Dr. Francis S. Collins, mentioned a breakthrough neuroscience project that Stanford University is working on with funding from NIH, DARPA, and the National Science Foundation.

“Traditionally, researchers have studied the postmortem brain by cutting a specimen into slim slices. While all that slicing generates neat, two-dimensional images, it also makes it impossible to reconstruct the connections of the brain’s tens of billions of neurons,” Collins said. “What if we could study the details of the wiring and the location of specific proteins in transparent 3-D?”

“Using a chemical cocktail,” he continued, “researchers at Stanford University—supported by NIH, NSF, and DARPA—have figured out a way to do just that. They’ve dubbed their technique ‘Clarity,’ and in an extraordinary technical feat, the team made possible a 3-D tour of an intact mouse brain illuminated by a green dye that marks the neurons.”

Clarity is now being applied to human brains, he added, and undoubtedly will advance the BRAIN Initiative, a research effort unveiled by President Barack Obama and Collins in April 2013. In his State of the Union message last year, the president addressed research and development, and its value to the nation.

“If we want to make the best products, we also have to invest in the best ideas,” Obama said. “Every dollar we invested to map the human genome returned \$140 to our economy—every dollar. Today, our scientists are mapping the human brain to unlock the answers to Alzheimer’s. They’re developing drugs to regenerate damaged organs, devising new material to make batteries 10 times more powerful.

“Now is not the time to gut these job-creating investments in science and innovation,” Obama added. “Now is the time to reach a level of research and development not seen since the height of the space race.”

During her testimony yesterday, Prabhakar also discussed the nature of the world today and its relation to research and development.

"In many ways we are living in very challenging times," she said. "Technology is getting more and more complex, [and] it's moving at a very rapid pace. Other nations are jockeying for position in global affairs, and many of them ... are making their own aggressive moves to build their own science and technology capabilities."

Meanwhile, here at home, she added, many are dealing with constrained resources, and many agencies are dealing with the corrosive effects of sequestration.

"But when I step back and look at what we have done over many decades in this country, I would observe that we have had a long and very successful commitment to investing in R&D as a nation," the director told the panel. "And when we make that investment in R&D, we are investing in two things that are deeply American."

One is the kind of creativity sparked by the open society that is the hallmark of the United States, she said, and in this case the nation is investing in the creativity of its scientists and engineers.

"The second thing is this drive to create a better future," Prabhakar added. "And in a sense, this is the most productive kind of restlessness you could possibly imagine."

### **Soldier, Civilian Employees Honored with 2014 SecArmy Awards**

ARMY NEWS SERVICE (MAY 5, 2014)

*Lisa Ferdinando*

WASHINGTON—Army civilian Carl E. Marchlewicz demonstrated selfless service when he was off the clock last year: he didn't even think twice before running into a burning home to rescue six children.

Marchlewicz was among a dozen Army civilian and military personnel honored today at the Pentagon, with the 2014 Secretary of the Army Awards.

Under Secretary of the Army Brad R. Carson said he is inspired by what the military and civilian workforce has accomplished, especially under "crushing fiscal constraints, which has forced the Army's soldiers and civilians to do so much more, with so much less."

The Army has awesome global responsibilities, requiring public servants with an unshakable degree of selflessness, he said.

"We will arrive prepared for the next conflict, as America always has, borne on the shoulders of those citizens that choose a life of public service," he said.

Carson said innovating in order to confront challenges is an Army tradition that dates back to the beginning of the service.

"I firmly believe that if we empower our public servants and trust their abilities, they will carry us beyond our furthest goals to accomplishments undreamed of," he said.

Carson said the awardees are the thinkers and risk-takers of this generation.

"Behind these awards are immense accomplishments, and behind these accomplishments are incredible people," he said.

### **AWARD FOR VALOR**

Marchlewicz, a mechanical engineer with Program Executive Office Ground Combat Systems in Warren, Mich., said an 11-year-old neighbor pounded on his door one afternoon last year saying, "My house is on fire!"

"I entered the kitchen and it was ablaze; the stove was on fire, it was melting the microwave," he said. "I grabbed my fire extinguisher, shot it and it went out, then all of a sudden, it flamed back up again like four times bigger."

Marchlewicz, who has been an Army civilian for more than a decade, was able to extinguish the blaze on the stove, but didn't know if there was a fire anywhere else, as the home was filled with thick, black smoke.

After rescuing four children, he returned to retrieve two children who were hiding in the basement. Marchlewicz said he "crawled in underneath the smoke and went downstairs and grabbed the children," bringing all the siblings to safety as firefighters arrived.

His citation for the award for valor reads that he acted without regard for his life or personal safety, and as "a result of his personal courage and selfless service, he saved six lives."

The actions were instinctual, he said. During the emergency, his only concerns were about finding the children and putting out the fire.



Under Secretary of the Army Brad R. Carson presents Carl E. Marchlewicz with the Secretary of the Army Award for Valor, during the 2014 Secretary of the Army Awards ceremony, at the Pentagon, May 5, 2014. U.S. Army photo

"I just have a hard time when people say 'hero.' You just do what you got to do," he said.

"We're awfully proud of Carl and the recognition is really well-deserved," said Brig. Gen. David Bassett, with PEO Ground Combat Systems in Warren, Mich. "Not everyone would have gone into that house, and Carl did."

*Note. Read about other 2014 SecArmy award winners at [http://www.army.mil/article/125359/Soldier\\_civilian\\_employees\\_honored\\_with\\_2014\\_SecArmy\\_Awards/](http://www.army.mil/article/125359/Soldier_civilian_employees_honored_with_2014_SecArmy_Awards/).*

### **Navy Scientist Honored for Leadership in Making Laser Weapons a Reality in the Fleet**

NSWC DAHLGREN DIVISION CORPORATE COMMUNICATIONS  
(MAY 7, 2014)

John J. Joyce

DAHLGREN, Va.—The scientist leading Navy Laser Weapon System efforts was commended May 7 at the Naval Surface Warfare Center Dahlgren Division (NSWCDD) annual honor awards ceremony.

NSWCDD Commander Capt. Brian Durant presented the Navy Meritorious Civilian Service Award to Theresa Genn-

aro for her leadership in the design, development, and integration of the Navy Laser Weapon System—slated for deployment aboard *USS Ponce* later this summer.

"I'm honored to have the opportunity to lead and work alongside these brilliant, hard-working, and dedicated scientists, engineers, and technicians," said Gennaro. "This amazing Laser Weapon System Team designed and developed the initial prototype, which has been demonstrated in repeated successes, including the Navy's first ever shoot downs of UAVs [unmanned aerial vehicles] from aboard a U.S. combatant—*USS Dewey* (DDG 105)—in 2012, making 12 for 12 total shoot downs in the testing series."

Durant presented the award to Gennaro as the audience—more than 220 civilian personnel and sailors—listened to NSWCDD Asymmetric Systems Department Head John Lysher read the citation at the University of Mary Washington Dahlgren campus.

"Through her direct leadership and work, the Solid State Laser Quick Reaction Capability (QRC) has continued successful integration and deployment of the Navy's first high-



SAN DIEGO (July 30, 2012)—The Laser Weapon System (LaWS) temporarily installed aboard the guided-missile destroyer *USS Dewey* (DDG 105) in San Diego, Calif., is a technology demonstrator built by the Naval Sea Systems Command from commercial fiber solid state lasers, utilizing combination methods developed at the Naval Research Laboratory. Theresa Gennaro, the scientist leading the Laser Weapons System efforts, was commended at the Naval Surface Warfare Center Dahlgren Division (NSWCDD) annual honor awards ceremony May 7. NSWCDD Commander Capt. Brian Durant presented the Navy Meritorious Civilian Service Award to Gennaro for her leadership in the design, development, and integration of the Navy Laser Weapon System—scheduled for deployment aboard *USS Ponce* later this summer. This capability provides Navy ships a method for sailors to easily defeat small boat threats and aerial targets without using bullets.

U.S. Navy photo by John F. Williams

energy laser system in an operational environment onboard a U.S. naval combatant," according to the citation.

The deployment on *Ponce* will prove crucial as the Navy continues its push to provide laser weapons to the fleet at large.

"I am extremely proud of our Laser Weapon System QRC team and their achievements to date," said Dale Sisson, NSWCDD Electromagnetic and Sensor Systems Department Head. "The team is truly world-class in every sense. Each and every member has gone above and beyond the call of duty, worked long hours, spent extended periods of time away from home, and pushed the envelope of technol-

ogy to prepare the Navy's first deployable high energy laser weapon for deployment aboard *Ponce*."

Gennaro's team will install the prototype—an improved version of the Laser Weapon System—on *Ponce* for at-sea testing in the Persian Gulf, fulfilling plans announced by Chief of Naval Operations Adm. Jonathan Greenert at the 2013 Sea-Air-Space Expo.

"Our team has the experience, knowledge, and passionate drive to reach the goal of delivering a laser weapon system to protect our warfighters," said Gennaro. "It is a great advantage to build an integrated team and lead this effort at NSWC Dahlgren where experts in multiple areas

ranging from laser weapons technology and laser lethality to E3 (electromagnetic environmental effects), ship integration, laser safety, and range testing are all available here on base—enabling us to continue to be the Navy’s Directed Energy Center of Excellence.”

The citation recognized Gennaro for establishing a strong project team across multiple integrated process teams and strengthening coordination with project sponsors, to include the Office of Naval Research and the Surface Navy’s Directed Energy and Electric Weapons Systems Program Office, also known as Naval Sea Systems Command (NAVSEA) PMS 405.

“Eighteen months ago, the Laser Weapon System Team was challenged to do something that had never been done before, a task that many senior leaders stated was impossible,” said Cmdr. Vincent Chernesky, NAVSEA PMS 405 Deputy Program Manager. “Theresa Gennaro led the technical team at NSWC Dahlgren through a breakneck development cycle, sacrificing personal time towards a common goal they all believed in—that naval laser weapons are a reality, and the future of naval weaponry.”

Over the past several months, Gennaro’s 65-member team—Navy engineers and scientists working with experts from industry and academia—significantly upgraded the Laser Weapon System.

“I cannot laud her and the Laser Weapon System Team enough for their heroic efforts,” said Chernesky.

Now, they are busy making final adjustments to the first of its kind laser weapon prototype.

“This team has incredible perseverance and they are a pleasure to work with,” said Gennaro. “The opportunity to take part in delivering such an advanced concept to protect our warfighter is a career highlight.”

Using a video game-like controller, sailors will be able to manage the laser’s power to accomplish a range of effects against a threat, from disabling to complete destruction.

“It is especially rewarding to see our civilian team working hand-in-hand with our warfighters to develop, demonstrate, and deliver this game-changing capability,” said Sisson. “This is yet another great example of NSWC Dahlgren Division’s ability to design, develop, and deliver an innovative and integrated solution to the fight.”

Navy leaders have made directed-energy weapons a top priority to counter what they call asymmetric threats, including unmanned and light aircraft and small attack boats that could be used to deny U.S. forces access to certain areas. High-energy lasers offer an affordable and safe way to target these threats at the speed of light with extreme precision and an unlimited magazine, experts say.

“I’m most appreciative of the opportunity to play a role in shaping the Navy’s future weapon systems,” said Sisson. “Without a doubt, I believe that time will prove our current period to be a major inflection point in Naval weapon system development. Simply put, we are making history.”

For more news from NSWC Dahlgren, visit <http://www.navy.mil/local/NSWCDD/>.

### **President Honors Army Public Servant for Strides in Soldier Protection**

*U.S. Army Research Laboratory (May 7, 2014)*

*Joyce P. Brayboy*

ADELPHI, Md.—Ronald Polcawich’s first chemistry test in high school was “eye-opening.”

He still remembers the disappointment he experienced that day with a class of his peers, many of whom failed the test in Morgan Hezlep’s class at Thomas Jefferson High School.

He and two of his chemistry classmates, who remained connected after they had left the small West Jefferson Hills School District, have flourished in science careers. “It was not about the chemistry we learned that year, but the analytical thinking that started the journey,” Polcawich said. “We left with an understanding of problem-solving.”

As Polcawich, team lead for Piezoelectric-Micro Electro-Mechanical Systems, or PiezoMEMS Technology at U.S. Army Research Laboratory, known as ARL, was congratulated by President Barack Obama for his Presidential Early Career Award for Scientists and Engineers, or PECASE, at the White House, April 14, he remembered the formative years that sparked his motivation in the sciences.

Polcawich received the PECASE for his outstanding research accomplishments and leadership in PiezoMEMS that have led to better soldier protection, and for his dedication to mentoring students in the sciences.

“Before I worked for the Army, I had no idea how hard soldiers have to work,” Polcawich said. “Now I understand just a snippet of what warfighters juggle on a routine basis. I’m simply here to make their jobs easier.”

The PiezoMEMS research is part of an Army investment to develop actuators and sensors that could swarm around future battlefields giving soldiers much better awareness of danger compared to current technologies.

"ARL is at the forefront in PiezoMEMS technology globally as a result of the leadership of Dr. Ronald Polcawich and the PiezoMEMS team pushing the limits of thin film piezoelectric materials and MEMS technology to see where they can take it," said Brett Piekarski, Micro and Nano Materials and Devices branch chief.

"The PiezoMEMS team collaborates with DoD, other government, industry, and academia both domestically and abroad to expand the body of knowledge in areas including thin film Lead Zirconate Titanate piezoelectric materials, MEMS fabrication techniques, MEMS modeling and design, and device characterization over a broad range of Army applications," Piekarski said.

"Think of a gas grill. As you depress the igniter, it generates surface charges that create a spark. Using the opposite effect, we can apply a voltage to the same material and create motion," Polcawich said. "That's what we want to do—get things moving."

His team has constructed devices comprised of a lead zirconate titanate, or PZT, thin-film as small as 100 nanometers on silicon wafers at ARL's Specialty Electronic Materials and Sensors Cleanroom in Adelphi, Md., a state-of-the-art facility that was just coming about when Polcawich arrived, in 1999.

He came to the laboratory motivated to be at one of the only places in the country where he could manipulate "smart" materials from development to a final product—a robotics device with motion and a sensor, Polcawich said. "I haven't looked back."

As he joined ARL full time, Polcawich returned to school for a graduate degree in material science engineering. He could not have graduated with the doctorate degree in 2007, without the support and collaborations with his colleagues and the summer student who assisted with his experimental measurements, he recalled.

The possibilities for a young, ambitious engineer at a defense research laboratory are without limits, he said. "If you get just one highly motivated student, the value can be tremendous."

Luz Sanchez was one of those motivated students. She came to the PiezoMEMS team in 2008, during her first year in graduate school. She defended her dissertation in December 2013, and will graduate from the University of Maryland, in May.

With a brother who retired from the Navy recently, Sanchez imagined that 20 years ago someone was doing the same research that she enjoyed to develop technology for him, she said.

"I could see the team getting stronger early on, and I wanted to be a part of it as a graduate student and as a professional," she said.

Sanchez said she admires her team leader's drive.

"Ron has so much going on, yet he always makes it his mission to be available for us," she explained. "It's good to have someone there when you need them."

The same summer Sanchez came to the laboratory, another student, Ryan Rudy, who was a college sophomore, also started with the team, and will be graduating with his Ph.D. from the University of Maryland, also in May.

The ARL student program attracts talented students from across the U.S. It has influenced the team's success since 2003, with small-scale robots at the millimeter scale, and other projects, Polcawich said.

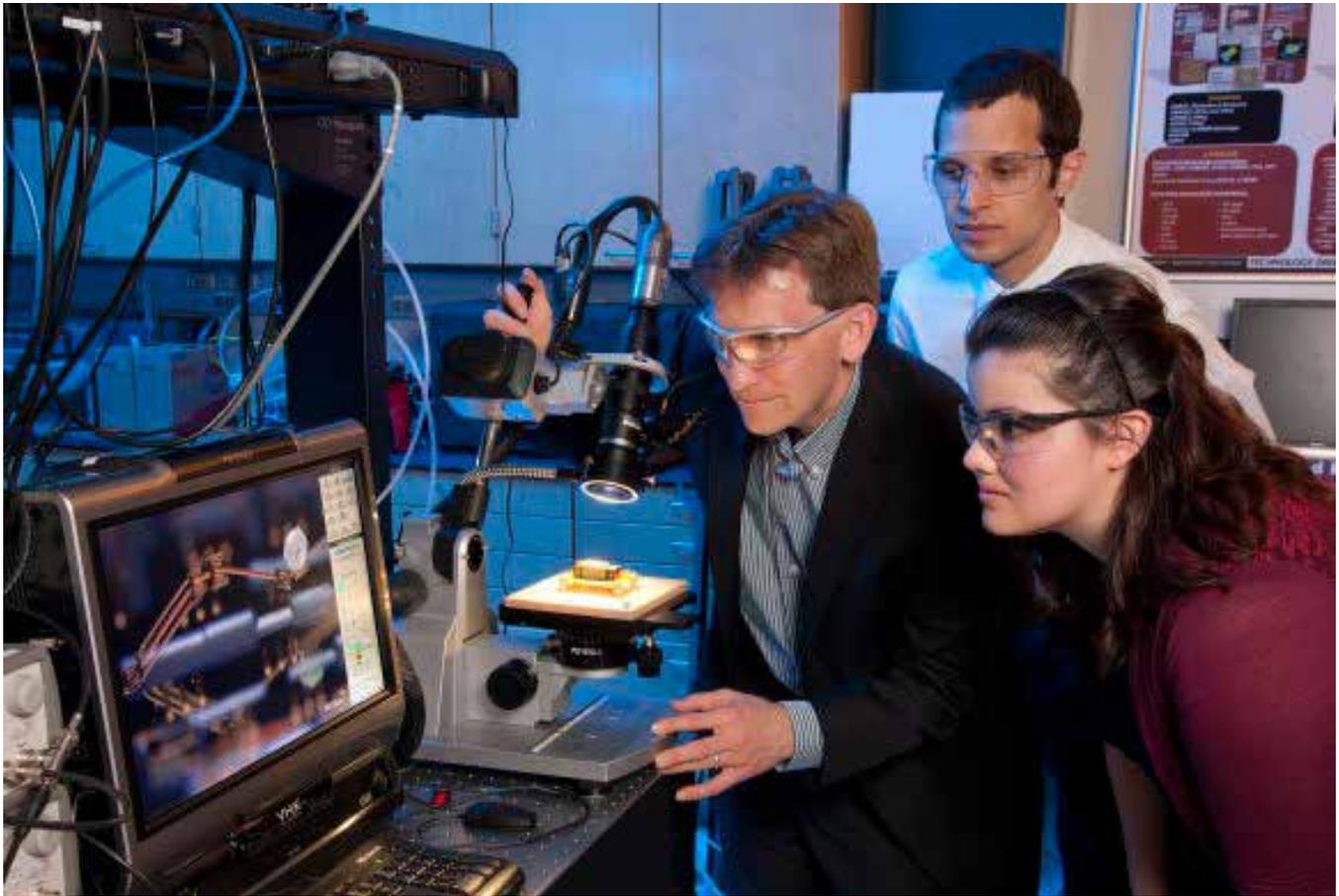
"Students leave our team after 12 weeks with a clear understanding of how their role impacts Army's goals," he said.

For Polcawich, the opportunity to meet the president was most memorable—that and the fact that with 102 scientists sitting in the audience at the awards ceremony, there were not a handful of similar research areas.

"It gave me an appreciation for the breadth of research in the federal government," he said.

Representatives from each of the departments and agencies presented certificates to their awardees.

As Polcawich heard his name among his most distinguished federal government colleagues, he said he could not help but be grateful he got the chance to speak to his 10th grade chemistry teacher before to the ceremony, to tell him "thank you."



Dr. Ron Polcawich, team lead for Piezoelectric-Micro Electro-Mechanical Systems Technology, Sensors and Electron Devices Directorate, at the U.S. Army Research Laboratory, has worked with Ryan Rudy and Luz Sanchez since 2008, when Rudy was a college sophomore and Sanchez was a first year graduate student. This year Polcawich received the Presidential Early Career Award for Scientists and Engineers, as two from his team will earn their doctoral degrees from the University of Maryland.

U.S. Army Research Laboratory photo

Other public servants awarded from Department of Defense laboratories: Dr. Greg Pitz and Dr. Onome Scott-Emuakpor from Air Force Research Laboratory, and Dr. Jeremy Robinson from Naval Research Laboratory.

The U.S. Army Research Laboratory is part of the U.S. Army Research, Development and Engineering Command, which has the mission to develop technology and engineering solutions for America's soldiers.

The U.S. Army Research, Development and Engineering Command is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army's premier provider of materiel readiness--technology, acquisition support, materiel development, logistics power projection and sustainment--to the total force, across the spectrum of joint

military operations. If a Soldier shoots it, drives it, flies it, wears it, eats it or communicates with it, AMC provides it.

### **VFA 31 Sailor Wins Maintainer of the Year Award**

NAVY NEWS SERVICE (MAY 13, 2014)

*Mass Communication Specialist 3rd Class (SW/AW) Ben Kelly*

ARABIAN SEA—The hard work and leadership qualities of Strike Fighter Squadron 31 (VFA 31) member Aviation Structural Mechanic (Equipment) 1st Class Morville Cunningham have earned him the 2014 Douglas L. Scott Memorial Maintainer of the Year Award.

The annual award is given to one sailor in recognition of superior performance and support in the field of aircraft egress systems and aircraft-mounted oxygen systems.



A Stryker lies on its side after surviving a buried improvised explosive device blast, in 2007.  
U.S. Army photo

As VFA 31's phase coordinator, Cunningham coordinated the maintenance actions of nine work centers to ensure scheduled, unscheduled, special, and conditional maintenance actions were performed in compliance with all directives.

"The award is for being the best at what we do, in regards to aviation life support," said Cunningham. "Safety for us is a very big deal. Some of the other rates have pre-operational checklists to make sure the work was done correctly, but for us that doesn't happen. When we do maintenance we have to make sure the maintenance is done by the book and to a 'T'. No steps can be missed because we are responsible for someone else's life."

The Naval fleet maintainer awards have been established to recognize active duty and reserve E1-E6 Navy and Marine Corps maintainers for their outstanding work in the fields of aviation life support, oxygen, egress, and night vision systems. The recipient's performance must have significantly impacted their command's day-to-day operations.

Nominees must be a designated aviation structural mechanic (equipment), or aircraft safety equipment (Marine). They must have made significant contributions to maintaining or improving aircraft readiness as it pertains to egress

and aircraft oxygen systems, ejection seats, crashworthy systems, or aircraft-mounted oxygen systems.

"Cunningham was nominated for the award, because of his outstanding work, along with his leading petty officer abilities," said Master Chief Aviation Maintenceman George Beebe, VFA 31 Maintenance Master Chief Petty Officer. "We brought him to maintenance control to work safe for flight, and he is on his way to advancing to chief petty officer; if not this year, then in the very near future. He is the best first class petty officer in his job in the Navy."

The award is for sailors who not only have a work ethic above and beyond their responsibilities, but also demonstrate leadership qualities that evoke superior performance of peers or subordinates.

"I've always been a hard worker and always strived to be the best," said Cunningham. "I try to mentor the people around me to teach them the same way that I became successful. I try to have them follow that same path, and be a positive role model for them. I work very hard and take my job very seriously, and I try to instill that in them."

Cunningham has been with VFA 31 since 2010, and supports the overall mission any way that he can. One of his goals is to keep everyone around him in the same mindset as he is, so that they can become successful.

"This award shows that my command believes in me," said Cunningham. "I get a lot of mentoring from my master chiefs, chiefs, and even some of the other E6s. For them to nominate me and think I'm worthy of it is a great thing to me. It tells me that they have my back."

Cunningham said he is very proud to have his name behind this award. It is the biggest award he has received since joining the Navy.

"This award reaffirms what we already knew," said Cmdr. Michael Rovenolt, commanding officer, VFA 31. "We truly have truly one of the most outstanding maintenance technicians in the entire Naval aviation community."

VFA 31 is a squadron of Carrier Air Wing (CVW) 8 attached to *George H.W. Bush*. CVW 8 and *George H.W. Bush* are supporting maritime security operations and theater security cooperation efforts in the U.S. 5th Fleet area of responsibility.

For more news from *USS George H.W. Bush* (CVN 77), visit <http://www.navy.mil/local/cvn77/>.

### **JIEDDO Launches Redesigned IED Knowledge Portal**

ARMY NEWS SERVICE (MAY 14, 2014)

A.J. Bosker • Nikki Bournes

WASHINGTON—Warfighters have a robust resource to help train for operating in environments plagued by improvised explosive devices.

The Joint IED Defeat Organization, known as JIEDDO, Knowledge and Information Fusion Exchange, known as JKniFE, provides training resources to prepare joint forces to successfully attack the improvised explosive device, or IED, network and future operating environments.

"The goal of the leadership at JIEDDO is to deliver training that meets the learning objectives identified by U.S. Central Command and the JIEDDO Joint Center of Excellence," said Sgt. Maj. James Carabello, JIEDDO senior enlisted adviser. "Central to this is the ability for U.S. forces to recognize an emplaced IED under a variety of complex attack scenarios in the contemporary operating environment."

The JKniFE portal, <https://jknife.jieddo.mil>, consolidates current, relevant counter-IED data from numerous sources



Maj. Christopher L. Genelin, an aeronautical engineer assigned to the Air Force Technical Applications Center, is the Air Force's 2013 Arthur S. Flemming Award winner. U.S. Air Force photo

into a central web portal easily accessible by warfighters with a common access card.

"The site's target audience includes junior enlisted and junior officers," said Carabello.

"One of the challenges of pre-deployment is letting troops know what training is needed beforehand," said Shelyv Convert, a JIEDDO training advisor. "The portal tackles this issue by providing an easy to follow 'road-to-war' training plan that references instructions and doctrine to tell warfighters when they need training and also why they need it."

The principal focus of JKniFE is counter-IED training.

"Enhancements made recently provide an improved warfighter resource, making information easier to gather and navigate from a more counter-IED focused data repository than its previous iteration," Convert said.

The site uses a first-contact approach to counter-IED training, which focuses on understanding how terrain is used as

a weapon, atmospherics, and how to think like an insurgent so warfighters can make predictions and be proactive rather than reactive, said Carabello.

The portal also provides awareness on theater operations via IED-event storyboards, after-action reports, tactics, techniques, procedures, and lessons learned. The portal is meant to be a definitive counter-IED resource for warfighters heading downrange to better prepare them for operations in an IED environment.

“Recent technical improvements to the site provide faster accessibility and download speeds, making information easier to retrieve,” said Convert. “Other improvements in site navigation and organization into a portal platform were a direct response to warfighter feedback.”

Features of the site help link users to the location of counter-IED training equipment throughout the continental United States. Through this module, warfighters can locate, connect, and train with the necessary equipment during pre-deployment ramp-up. The availability status of this equipment along with other documents found on the portal are maintained and updated by a team of professional content managers, Convert said

### **Aeronautical Engineer Collars National-Level Award**

*Air Force Technical Applications Center Public Affairs (May 20, 2014)*  
*Susan A. Romano*

PATRICK AIR FORCE BASE, Fla. (AFNS)—An aeronautical engineer assigned to the Air Force Technical Applications Center here earned the Air Force’s top billing for the 2013 Arthur S. Flemming Award.

Maj. Christopher L. Genelin learned of his selection for the prestigious national-level award in April when the committee phoned to congratulate him on being chosen to represent his organization.

Established in 1948, the annual award recognizes outstanding federal employees who make significant and extraordinary contributions to the federal government. Winners are selected from all areas of federal service and are formally recognized by the president of the United States.

There are three possible award categories: applied science, engineering, and mathematics; managerial or legal achievement; or basic science. Genelin was nominated in the applied science, engineering, and mathematics category.

In his nomination package, Genelin was recognized for his work on a persistent global surveillance system for operation

in a maritime environment. His prototype system was the first of its kind, and incorporated an electro-optical sensor paired with a satellite data exfiltration path integrated onto an unmanned surface vehicle. The system, which was developed in response to an urgent operational warfighter requirement, was engineered and fabricated entirely in-house at a savings of \$4 million in research and development costs.

“For the last 65 years, the Flemming Award has become one of the most coveted and distinguished awards recognizing excellence in federal service,” said Maj. Gen. John N.T. Shanahan, the commander of the Air Force Intelligence, Surveillance and Reconnaissance Agency, and AFTAC’s higher headquarters. “Many of its recipients have gone on to greater fame and achievement, including the Nobel Prize. I am extremely proud to announce that Maj. Genelin is one of 12 winners from the entire federal government to earn this award. It is an incredible achievement.”

Genelin, whose been assigned at AFTAC since May 2012, was humbled by the recognition.

“I’ve never spent too much time seeking the limelight, but it’s definitely nice to be formally recognized for your hard work,” Genelin said. “I have been fortunate to have been given the opportunity throughout my career to work at the ‘pointy end of the spear’ and make tangible impacts for the warfighter.”

The recipient’s award submission was reviewed by a panel of Air Force colonels and Senior Executive Service civilians. As a military nominee, Genelin is now authorized to wear the Air Force Recognition Ribbon on his service dress uniform.

A panel of distinguished, nationally prominent judges and consultants will recognize the winners at a ceremony in June in Washington, D.C.

“I’m excited for the trip to Washington,” Genelin said. “I am taking my wife Donna with me since she played a very large role in me being able to win such an award. She deserves just as much of the recognition for what she has done for my career and our family.”

He added, “I want to thank all my co-workers who have stood behind my ideas and my direct-line supervisors who took chances on me and gave me the opportunity to excel. I’m indebted to them.”

The award is named after Dr. Arthur Flemming, a career public servant who started his career in 1939 and spent seven decades in service to the federal government and higher education. In 1994, just two years before his death,



Lance Hall, an engineer with the U.S. Army Aviation and Missile Research Development and Engineering Center, describes his six-month assignment working in the Additive Manufacturing Lab at NASA's Marshall Space Flight Center.  
Photo by Ryan Keith, AMRDEC Public Affairs

President Clinton awarded Flemming with the Medal of Freedom in recognition of his dedication to the nation.

### **Army, NASA, University Collaboration Promotes Additive Manufacturing**

*U.S. Army Aviation and Missile Research Development and Engineering Center Public Affairs (May 22, 2014)*  
Ryan Keith

REDSTONE ARSENAL, Ala. (May 22, 2014)—Additive manufacturing is changing the way organizations design and manufacture products around the world.

Here, the U.S. Army Aviation and Missile Research Development and Engineering Center, known as AMRDEC; NASA's Marshall Space Flight Center, known as MSFC; and the University of Alabama in Huntsville, are leading a collaborative effort to share knowledge and resources to promote this emerging technology.

Additive manufacturing, or AM, refers to a process by which digital 3-D design data is used to build up a component by depositing successive layers of liquid, powder, paper, or sheet material. Many, including President Barack Obama, have identified additive manufacturing as a potential game

changer with important implications to national security and the federal government.

In May, leaders from AMRDEC and MSFC officially established an Additive Manufacturing Integrated Product Team. The IPT's mission is to engage in research and development efforts that advance the state of the art in AM to ensure that Team Redstone can capitalize on the rapid advancements in this technology.

Members of the IPT include, from AMRDEC, Dr. Amy Grover, Brian Harris, Keith Roberts, William Alvarez, Pete Black, and Patrick Olinger; and from MSFC, Niki Werkheiser, Ken Cooper, and Erin Betts.

"When you come to learn and appreciate the potential of AM, it's hard not to judge this as a true game-changer—one that will ultimately have far reaching, historical impacts onto our society at-large," said acting AMRDEC Director James Lackey.

AMRDEC is looking currently at trade studies investigating AM, to minimize cost and optimized performance of missile structures, using topology optimization routines to enhance

design and analysis of AM built structures, and characterizing materials and processes for specific missile applications.

“Teaming with NASA MSFC and other partners, AMRDEC will investigate procurements of AM machines to support our research needs, build a cadre of engineers and scientists savvy on this technology, [and] fabricate and performance test qualify components for ground and flight test,” he said.

Dr. Dale Thomas, Marshall Center’s associate director, technical, signed the IPT charter for NASA.

“Additive manufacturing is a step toward the future,” he said. “It is changing the way organizations design and manufacture products around the world, and space is one of the key places where humanity will see the impact of this technology.”

The agreement was facilitated by Phil Farrington, professor of industrial and systems engineering and engineering management at the University of Alabama in Huntsville.

“This effort continues a long tradition of collaboration between the AMRDEC and Marshall. This exciting new technology has the potential to radically change the way we manufacture aerospace and defense systems,” said Farrington. “One of the team’s goals is to identify additive manufacturing research and development needs of greatest importance to the defense and space community.”

AMRDEC is part of the U.S. Army Research, Development and Engineering Command, which has the mission to develop technology and engineering solutions for America’s soldiers.

RDECOM is a major subordinate command of the U.S. Army Materiel Command. AMC is the Army’s premier provider of materiel readiness—technology, acquisition support, materiel development, logistics power projection, and sustainment—to the total force, across the spectrum of joint military operations. If a soldier shoots it, drives it, flies it, wears it, eats it, or communicates with it, AMC provides it.